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## **Cocaine use in Europe - a multi-centre study: patterns of use in different groups**

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Olsson, B ; Primorac, A ; Fischer, G ; Güttinger, F ; Rehm, J ; Krausz, M

**Abstract:** **AIM** The study investigates patterns of cocaine powder and crack cocaine use of different groups in nine European cities. **DESIGN, SETTING, PARTICIPANTS** Multi-centre cross-sectional study conducted in Barcelona, Budapest, Dublin, Hamburg, London, Paris, Rome, Vienna, and Zurich. Data were collected by structured face-to-face interviews. The sample comprises 1,855 cocaine users out of three subgroups: 632 cocaine users in addiction treatment, mainly maintenance treatment; 615 socially marginalized cocaine users not in treatment, and 608 socially integrated cocaine users not in treatment. **MEASUREMENTS** Use of cocaine powder, crack cocaine and other substances in the last 30 days, routes of administration, and lifetime use of cocaine powder and crack cocaine. **FINDINGS** The marginalized group showed the highest intensity of cocaine use, the highest intensity of heroin use and of multiple substance use. 95% of the integrated group snorted cocaine powder, while in the two other groups, injecting was quite prevalent, but with huge differences between the cities. 96% of all participants had used at least one other substance in addition to cocaine in the last 30 days. **CONCLUSIONS** The use of cocaine powder and crack cocaine varies widely between different groups and between cities. Nonetheless, multiple substance use is the predominating pattern of cocaine use, and the different routes of administration have to be taken into account.

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# Cocaine Use in Europe – A Multi-Centre Study: Patterns of Use in Different Groups

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## Key Words

Cocaine powder · Crack cocaine · Consumption patterns

## Abstract

**Aim:** The study investigates patterns of cocaine powder and crack cocaine use of different groups in nine European cities. **Design, Setting, Participants:** Multi-centre cross-sectional study conducted in Barcelona, Budapest, Dublin, Hamburg, London, Paris, Rome, Vienna, and Zurich. Data were collected by structured face-to-face interviews. The sample comprises 1,855 cocaine users out of three subgroups: 632 cocaine users in addiction treatment, mainly maintenance treatment; 615 socially marginalized cocaine users not in treatment, and 608 socially integrated cocaine users not in treatment. **Measurements:** Use of cocaine powder, crack cocaine and other substances in the last 30 days, routes of adminis-

tration, and lifetime use of cocaine powder and crack cocaine. **Findings:** The marginalized group showed the highest intensity of cocaine use, the highest intensity of heroin use and of multiple substance use. 95% of the integrated group snorted cocaine powder, while in the two other groups, injecting was quite prevalent, but with huge differences between the cities. 96% of all participants had used at least one other substance in addition to cocaine in the last 30 days. **Conclusions:** The use of cocaine powder and crack cocaine varies widely between different groups and between cities. Nonetheless, multiple substance use is the predominating pattern of cocaine use, and the different routes of administration have to be taken into account.

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## Introduction

Against the background of rising figures of cocaine use in Europe, a multi-centre study was carried out to define target group specific recommendations in order to improve the specific care for cocaine and crack users [Haasen et al., this issue]. One part of this multi-method study was a user investigation, i.e. quantitative interviews with cocaine users to analyse their consumption behaviour, social and health status and support needs.

Evidence so far suggests that cocaine is used in different drug using groups in Europe. Accordingly, given the importance of contextual factors for substance use in general, it may be assumed that patterns of cocaine use vary across different subgroups, and therefore are accompanied by different consequences of use. Hence, in the consumer investigation three different subgroups of cocaine users were recruited, each seen as relevant with respect to cocaine use. One group consisted of cocaine users who are treated in a drug-specific setting, mainly outpatient maintenance treatment, since a number of studies have shown that concurrent abuse of cocaine is widespread in methadone patients [1–3]. The second group consisted of socially marginalized drug users who belong to the ‘old’ drug scene of heroin users and who are outside a drug specific treatment. In this group, an increasing use of cocaine has been observed in recent years [4, 5]. Socially integrated drug users who are using cocaine mainly in recreational contexts constituted the third target group, since cocaine use in this group seems to play an important role as a part of an occasional use, e.g. at dance events or ‘raves’ [6].

In addition to taking different users groups into account, the distinction between cocaine hydrochloride, or cocaine powder, and crack cocaine is of central importance with respect to the patterns of cocaine use. Crack cocaine is associated with different sequences or progressions of use [7, 8], different routes of administration and subsequent degrees of abuse liability and propensity for dependence [9, 10], different users groups [11, 12], and different treatment outcomes [13, 14].

Hence, the analyses presented here mainly focus on two aspects: (1) differences in the consumption behaviour between the different groups of cocaine users, and (2) differences between the use of cocaine powder and crack cocaine.

## Methods

### *Design*

In each participating city, cocaine and crack users from three different subgroups were recruited: 70 cocaine/crack users in drug treatment, mainly maintenance treatment; 70 socially marginalized cocaine/crack users outside a drug specific treatment, and 70 socially integrated cocaine/crack users not in a drug-specific treatment.

The three target groups were recruited at specific locations suitable to access the respective groups. The treatment group was recruited mainly in out-patient maintenance clinics or, if not possible, in other (inpatient or outpatient) addiction treatment settings. The marginalized group was recruited at places where drug users usually meet to sell, buy or use drugs, or in the surroundings of low-threshold addiction facilities, e.g. needle exchange programmes or safe injection rooms. The integrated group was recruited at different party places, e.g. discos, nightclubs or pubs, or through private contacts. To exclude an overlap between the three target groups, each centre determined specific recruitment locations, i.e. treatment facilities and places typically attended by the two other groups.

Besides affiliation to the respective target group, the inclusion criterion was a use of cocaine powder or crack cocaine at least once in the last month. The three target groups were recruited according to a criterion-oriented sample strategy: They were recruited consecutively until 70 cocaine and crack consumers were included into each subsample ( $n = 210$  for each centre). Subjects at the determined recruitment locations were first asked with regard to the inclusion criteria. If these were met and after the subject gave informed consent, the interview took place. After the interview, the participants received 10 Euro or a respective compensation fee.

### *Measures*

Structured face-to-face interviews were conducted to assess the consumption behaviour, social and health status. The instrument used was an adjusted version of the Maudsley Addiction Profile MAP [15]. Besides, self-ratings were used to assess the dependence upon cocaine using the Severity of Dependence Scale SDS [16], the treatment motivation by means of Transtheoretical Model-based instruments [17, 18], and the present treatment and service utilisation behaviour, which all will be analyzed in future manuscripts.

The MAP is a brief, interviewer-administered questionnaire that measures problems in four domains: substance use, health-risk behaviour, personal/social functioning, and physical and psychological health. The MAP was extended with items concerning the patterns, and the history of cocaine and crack use, the number of drug- or alcohol-specific treatments, and some items concerning the social situation. All instruments and a user manual following the original manual [19] were provided in English or in German. If necessary, they were translated into the respective language and, as a control, back-translated.

Data on substance use was assessed according to the total number of days of use within the last 30 days, and the routes of administration. In case of more than one route of administration, the most severe was recorded. In addition to the current drug use data, lifetime data assessed according to the EuropASI [20] was reported for cocaine powder and crack cocaine.

### *Subjects*

Because of the low prevalence of cocaine in Stockholm [Haasen et al., this issue], it was not possible to recruit a sufficient number of

cocaine users who met the inclusion criterion of having used cocaine powder or crack cocaine at least once in the past month. Therefore, the following analysis is based on data from nine European cities.

The total number of subjects is 1,855, with 34% belonging to the treatment group, 33% to the marginalized group, and 33% to the integrated group. There are small deviations from the originally intended sample size of 70 cocaine users in each group and each city: for the marginalized group in Dublin ( $n = 73$ ), Paris ( $n = 74$ ), London ( $n = 57$ ) and Zurich ( $n = 61$ ), for the integrated group in Dublin ( $n = 51$ ) and Paris ( $n = 67$ ), for the treatment group in Dublin ( $n = 71$ ) and Paris ( $n = 71$ ).

As regards the recruitment places the subjects were in general recruited as intended. In the treatment group, 81% were recruited in maintenance clinics, 9% in other drug treatment services. The marginalized group was mainly recruited in low-threshold facilities (58%), on the drug scene (16%), or via snowballing (10%). The integrated group was recruited mainly at night-life sites (38%) or via snowballing (40%) and the rest (17%) at different medical services or public places.

#### *Procedure*

In this paper, the main focus of the statistical analyses is on a comparison between the target groups. Additionally, major differences between cities within each target group are mentioned. Only established statistical procedures were used. The comparison of frequencies was done by means of  $\chi^2$  test. For the comparison of means, only nonparametric techniques were used (Kruskal-Wallis test, Mann-Whitney test), because the distribution of values of all variables under examination in this paper was not normal.

For the comparison between the target groups, differences between each pair of means were analyzed using an adjusted significance level of  $p < 0.01$ , for the comparison between subgroups within each target group the significance level was  $p < 0.001$ .

## **Results**

### *Sample Characteristics*

Thirty-two percent of the 1,855 participants were female. The highest proportion of females (37%) was found in the integrated group, followed by the marginalized group (31%) and the treatment group (28%). The proportion of females varied widely between the cities, ranging from less than 20% in Barcelona and Paris to 40% and more in London and Dublin.

The average age of the whole sample was  $30.8 (\pm 7.4)$  years, ranging from 16 to 62 years. On average, males ( $31.7 \pm 7.5$  years) were 3 years older than females ( $28.8 \pm 6.6$  years), and the treatment group ( $33.1 \pm 7.6$  years) was older than the marginalized group ( $31.3 \pm 7.0$  years), which again was older than the integrated group ( $27.9 \pm 6.5$  years).

The distinction between the marginalized group and the integrated group was primarily based on the degree of social integration, or disintegration, respectively. And, as

expected, there were significant differences between the target groups, and these differences were pointing in the expected direction with the lowest degree of social integration in the marginalized group. Twenty-one percent of the marginalized group had lived in unstable living arrangements in the past 12 months, compared to 2% in the integrated group and 10% in the treatment group. The marginalized group showed the highest rate of current unemployment (74%, integrated group: 18%; treatment group: 67%), and only 34% indicated no criminal activities in the past 30 days prior to the interview, while this was true for 58% in the integrated group, and 50% in treatment group. On the other hand, these results cannot disguise that a substantial minority of those classified as socially marginalized in fact seemed to live in a relatively good social situation as regards living arrangements, employment, and the possibility to abstain from criminal activities.

### *Use of Cocaine Powder and Crack Cocaine*

In total, 86% of all subjects had used cocaine powder in the past 30 days prior to the interview, 27% had used crack cocaine. The comparison between the three subgroups as a whole shows that as expected the use of cocaine powder was highest in the marginalized group, followed by the treatment group, which again used more frequently than the integrated group. For crack cocaine, the differences were in the same direction and again significant between the three groups (table 1).

On the other hand, the differences especially between the treatment group and the marginalized group were, although statistically significant, not as marked as expected. One explanation for this was the different prevalence of powder cocaine and crack cocaine, respectively (fig. 1). The prevalence of cocaine powder use was comparatively low in the marginalized group in Paris, London and Hamburg, and in London and Paris in the treatment group as well. On the other hand, in these three cities crack cocaine played an important role in terms of a high prevalence in the treatment group and in the marginalized group. In the integrated group, in 5 of the 9 cities a small number of crack cocaine users was found, but in general the use of cocaine powder was predominating in all of the nine cities.

As figure 1 also indicates, a small number of subjects used cocaine powder as well as crack cocaine. The use of only one form of cocaine was the most frequent, and in total 73% used cocaine powder alone, and 14% used crack cocaine alone. But in sum 12% currently used crack cocaine as well as cocaine powder, 40% of them belonging

**Table 1.** Substance use: days with use in the last 30 days by target group

Substance	Target group						$\chi^2$	p
	treatment (n = 632)		marginalized (n = 615)		integrated (n = 608)			
	mean	SD	mean	SD	mean	SD		
Cocaine powder	11.2 <sup>a, b</sup>	11.1	13.9 <sup>a, c</sup>	12.6	7.0 <sup>b, c</sup>	6.7	32.1	<0.001
Crack cocaine	5.5 <sup>a, b</sup>	10.2	7.9 <sup>a, c</sup>	11.8	0.2 <sup>b, c</sup>	1.7	231.91	<0.001
Alcohol	9.6 <sup>a, b</sup>	12.0	7.3 <sup>a, c</sup>	10.5	13.8 <sup>b, c</sup>	9.8	167.38	<0.001
Heroin	8.6 <sup>a, b</sup>	11.7	15.0 <sup>a, c</sup>	13.6	1.0 <sup>b, c</sup>	4.8	513.67	<0.001
Non-presc. methadone	1.5 <sup>a, b</sup>	5.7	1.8 <sup>a, c</sup>	5.4	0.1 <sup>b, c</sup>	1.3	112.7	<0.001
Non-presc. medication	6.7 <sup>a, b</sup>	10.7	4.6 <sup>a, c</sup>	9.0	1.1 <sup>b, c</sup>	4.6	167.43	<0.001
Amphetamines	0.9 <sup>a, b</sup>	3.9	1.1 <sup>a, c</sup>	4.1	1.8 <sup>b, c</sup>	3.3	230.81	<0.001
Cannabis	11.4 <sup>a</sup>	12.6	10.8 <sup>b</sup>	12.3	15.0 <sup>a, b</sup>	12.5	44.72	<0.001
Hallucinogens	0.3 <sup>a</sup>	2.8	0.5 <sup>b</sup>	3.2	0.6 <sup>a, b</sup>	1.8	112.18	<0.001
Inhalants	0.0 <sup>a</sup>	0.1	0.1 <sup>b</sup>	1.3	0.2 <sup>a, b</sup>	1.4	41.96	<0.001

Means in a row sharing the same superscript letter differ significantly at  $p < 0.01$  (Mann-Whitney tests).

to the treatment group, 47% to the marginalized group and 13% to the integrated group.

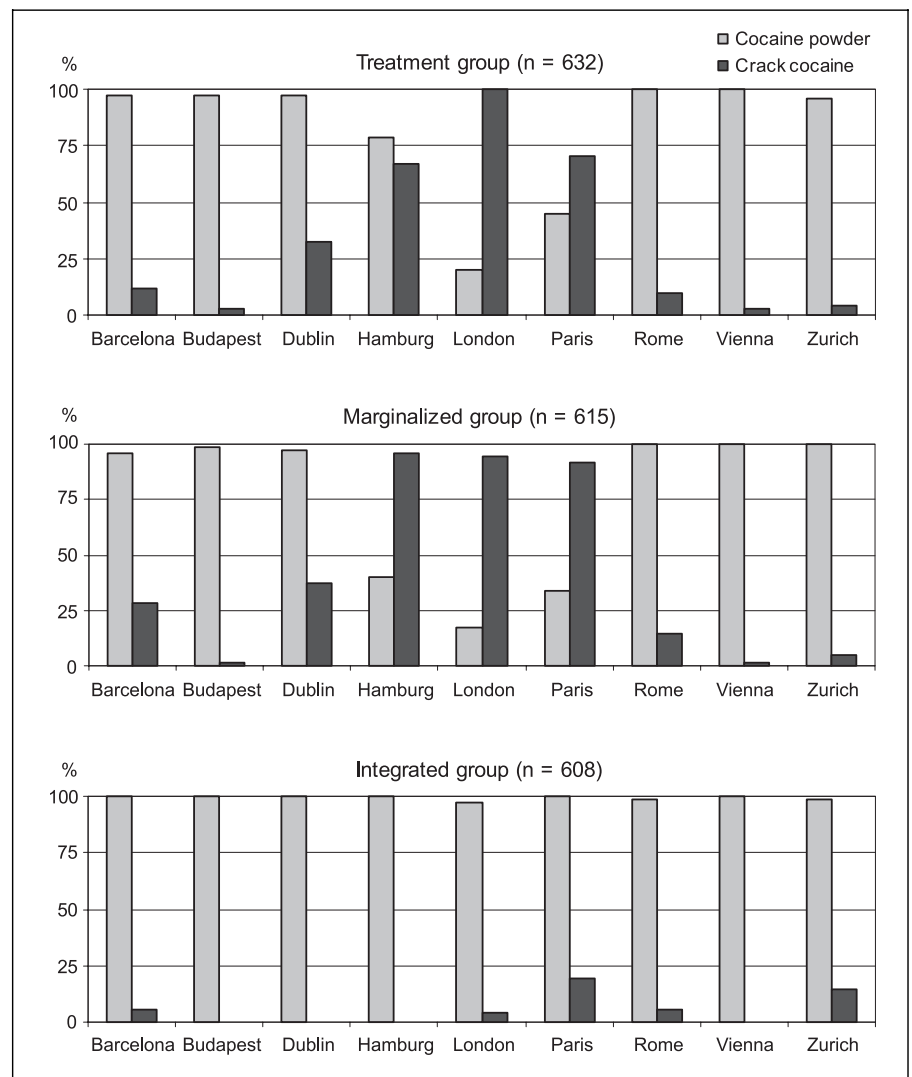
Accordingly, when looking at the differences between the target groups, the different prevalence of crack cocaine and the different patterns of use have to be taken into account. This was done using the maximum number of days with use of either cocaine powder or crack cocaine. Then, the marginalized group used cocaine on 20.3 ( $\pm 10.7$ ) days, whereas the treatment group has used on 15.7 ( $\pm 11.0$ ) days ( $Z = -7.47$ ,  $p < 0.001$ ). Due to the very low prevalence of crack cocaine in the integrated group, the values here did not change remarkably (7.0  $\pm$  6.7 days).

For the use of cocaine in general, the proportion of regular users was computed, with a use of more than two times per week as the criterion for regular use. Results show that only 37% of the integrated group used cocaine regularly, compared to 66% of the treatment group and 81% of the marginalized group ( $\chi^2_{(2)} = 261.54$ ,  $p < 0.001$ ). This pattern, i.e. highest proportion of regular users in the marginalized group followed by the treatment group and lowest frequency in the integrated group, was found in 7 of the 9 cities, except Zurich, where a higher proportion of regular users was found in the treatment group than in the marginalized group (76 vs. 69%), and in Budapest with the highest proportion of regular users in the treatment group (94%) followed by the integrated group (69%) and the lowest proportion in the marginalized group (43%).

#### *Routes of Cocaine Administration*

In principle, all routes of administration were found, but the oral use was only practiced by 7 subjects, 2 out of the treatment group, 3 out of the marginalized group and 2 out of the integrated group. Within the integrated group, the predominant route of administration of cocaine powder was snorting, which was practiced by 95% of all cocaine powder users in this group. Four percent were smoking or chasing cocaine powder in this group, and 2% were injecting. There were only marginal differences between the cities within this group, and the lowest prevalence of snorting cocaine powder was found in Paris with 88%.

There were no differences in the routes of administration between the two other groups ( $\chi^2_{(2)} = 2.04$ ,  $p = 0.361$ ). In each case about 60% of the cocaine powder users were injecting (treatment: 58%; marginalized: 61%), about one third were snorting (treatment: 36%; marginalized: 32%), and 5% in the treatment group and 6% in the marginalized group were smoking or chasing cocaine powder. Although very similar at first sight, the routes of administration differed markedly between the cities. In Budapest about 90% of cocaine powder users in both treatment and marginalized group were snorting, whereas in Dublin, Hamburg, Vienna, and Zurich, injecting was the predominant route of using cocaine powder, with rates ranging from 70% in Hamburg to 84% in Zurich for the treatment group, and from 65% in Zurich to 99% in Vienna for the marginalized group. In Barcelona, Paris and Rome, about



**Fig. 1.** 30-day prevalence of cocaine powder and crack cocaine by target group and city.

50% of the cocaine powder users in the treatment group were injecting, but snorting was also quite common with rates of about 40%. Snorting was even more frequent than injecting in the marginalized groups in Paris (48 vs. 32%) and Rome (57 vs. 30%), whereas in Barcelona 97% of the cocaine users in the marginalized group were injecting.

About 90% of the crack cocaine users were smoking, about 10% were injecting. Injecting crack cocaine was largely restricted to Paris and London, and in each case both to the treatment group and the marginalized group. For those who had used cocaine powder as well as crack cocaine ( $n = 230$ ), in general two groups of users with respect to the application mode were found. Forty-four percent of the parallel users were injecting cocaine powder and smoking crack cocaine, 37% were smoking crack

cocaine and snorting cocaine powder. A pattern of using one application mode for both forms was only found for 7% (smoking) and 5% (injecting). But there was a strong relationship between injecting cocaine powder and injecting heroin. Seventy-eight percent of the cocaine powder injectors had used heroin as well. The very small group of those injecting crack cocaine ( $n = 49$ ) had a prevalence of heroin use of 59%.

#### *Lifetime Use of Cocaine Powder and Crack Cocaine*

Only 7% in both treatment group and marginalized group stated no regular lifetime cocaine use (period of at least 6 months with regular use), while this was true for 29% in the integrated group ( $\chi^2_{(2)} = 171.85$ ,  $p < 0.001$ ). The proportion of those within the integrated group, who

indicated no regular lifetime use varied extremely between the cities. While in Dublin 82% of the integrated group reported no regular use, this was the case for only 6% in Budapest. Rates of about 40% were found in Barcelona, Hamburg and Paris, rates between about 10 and 20% in London, Rome, Vienna and Zurich.

For those, who had had a period of regular lifetime use of cocaine, there were differences between the three groups in the years of use ( $\chi^2_{(2)} = 77.33$ ,  $p < 0.001$ ), but not in the age of initiation. Here, the minimum value for the age of initiation and the maximum value for the years of use of either cocaine powder or crack cocaine were used. For all three target groups, the age of initiation of regular cocaine use was between 22 and 23 years on average (treatment:  $22.8 \pm 6.5$  years; marginalized:  $22.3 \pm 6.3$  years; integrated:  $22.9 \pm 5.4$  years), whereas the years of regular use differed between the integrated group ( $4.3 \pm 3.6$  years) on the one hand, and both treatment group ( $6.7 \pm 5.2$  years;  $p < 0.01$ ) and marginalized group ( $6.9 \pm 5.6$  years;  $p < 0.01$ ) on the other.

In general, regular crack cocaine use started later than the regular use of cocaine powder. The mean age of initiation of those, whose only lifetime use was regular use of cocaine powder ( $n = 1,126$ ), was  $22.6 (\pm 6.0)$  years, and this was about 3 years earlier than the mean age of initiation of those ( $n = 163$ ) with a regular use of crack cocaine only, who started at  $25.8 (\pm 7.5)$  years ( $Z = -5.13$ ,  $p < 0.001$ ). Of all participants, 15% ( $n = 282$ ) reported a regular lifetime use of both cocaine powder and crack cocaine. The mean age of initiation here was  $21.2 (\pm 5.2)$  years for cocaine powder, and the regular use of crack cocaine started about 4 years later at  $25.1 (\pm 6.8)$  years ( $Z = -10.18$ ,  $p < 0.001$ ). In this group, only 9% started to use cocaine powder regularly after they already had begun using crack cocaine, while about two thirds started crack cocaine use later than the use of cocaine powder and about a quarter started using both forms at about the same age. Half of those with a regular lifetime use of both cocaine powder and crack were still using both forms, while one third were only using crack cocaine, and 17% only cocaine powder in the last 30 days.

#### *Use of Other Substances*

Sixty-nine percent of all cocaine users had also used cannabis, 67% had used alcohol in the last 30 days prior to the interview. Forty-four percent currently used heroin, 32% non-prescribed medication, and 23% amphetamines. Non-prescribed methadone was used by 11%, hallucinogens by 10%, and inhalants by 2%.

Alcohol use was highest in the integrated group, followed by the treatment group, and lowest in the marginalized group (table 1). The integrated group also used cannabis significantly more often than both treatment group and marginalized group. The predominating substance in the marginalized group was heroin. The marginalized group also used non-prescribed medication (mainly benzodiazepines) quite often, but less frequently than the treatment group. The use of amphetamines, non-prescribed methadone, hallucinogens and inhalants was very low in all the groups, and not more frequent than two days on average in each target group. Again, there were huge differences between the cities. However, despite the differences between the target groups, and within the target groups between the cities, the overall consumption pattern was multiple substance use. Ninety-six percent of all participants had used at least one other substance in addition to cocaine powder or crack cocaine in the last 30 days.

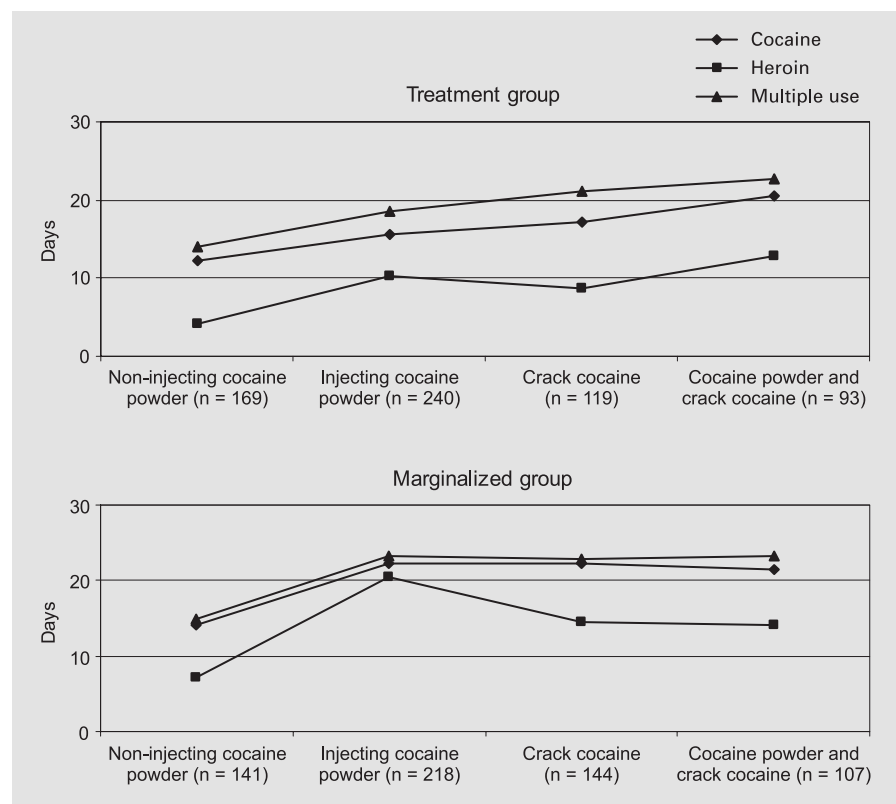
#### *Differences between Cocaine Powder and Crack Cocaine*

Finally, data were analysed with respect to differences in the consumption patterns between cocaine powder and crack cocaine users. Since the prevalence of crack cocaine was very low in the integrated group, this analysis was restricted to the treatment group and the marginalized group, and because of the differences between these target groups, the data were analysed separately for each target group. Due to the importance of the routes of administration, the group of those using only cocaine powder was divided up into two subgroups, those injecting cocaine powder and those using cocaine powder by non-injecting modes, i.e. snorting, smoking or orally. Hence, for each of the two target groups under examination, four subgroups were created: non-injecting cocaine powder users, which represented 27% of the treatment group and 23% of the marginalized group, injecting cocaine powder users (treatment 39%, marginalized 36%), crack cocaine users (treatment 19%, marginalized 24%) and parallel users, i.e. those who currently used both delivery systems (treatment 15%, marginalized 17%). There were no differences between the two target groups as regards the proportion between these subgroups ( $\chi^2_{(3)} = 6.84$ ,  $p = 0.077$ ).

In each target group, the most outstanding differences between the cocaine consumption groups were found for the use of cocaine in general, heroin and multiple substance use (fig. 2).

In both the treatment and marginalized group, the non-injecting cocaine powder group showed a lower in-

**Fig. 2.** Cocaine, heroin and multiple substance use: days with use in the last 30 days by cocaine consumption group for treatment and marginalized group. Cocaine refers to the maximum number of days with use of either cocaine powder or crack cocaine, multiple substance use to the number of days with use of more than one substance.



tensity ( $p < 0.001$ ) of cocaine, heroin and multiple substance use, compared to the three other groups, which at the same time showed similar pattern of use. The only exception was a higher heroin use in the injecting cocaine powder group compared to the crack cocaine group and the group of parallel users.

## Discussion

Within the framework of a multi-centre and multi-method study on treatment needs of cocaine users in Europe, data from 1855 cocaine users out of three different subgroups were gathered in nine European cities. The analyses presented in this paper outline the first evaluation of data concerning the current and lifetime use, and routes of administration of cocaine as well as the use of other substances, and the central focus was on the differences between the three subgroups on the one hand, and the differences between cocaine powder and crack cocaine, on the other.

In the group of socially integrated cocaine users, the majority was snorting cocaine powder, while crack co-

caine only played a very marginal role in this group. Overall, nearly one third in this group had never used cocaine regularly, and currently about two thirds were using cocaine irregularly. Hence, compared to the two other groups, the integrated group showed the least problematic cocaine use. For the other two groups, i.e. for socially marginalized cocaine users and cocaine users in a specific addiction treatment, the results were at first sight quite similar. Despite statistically significant differences in the frequency of cocaine powder and crack cocaine use between both groups, these differences may not be clinically relevant, and no differences were found for the overall comparison of the routes of administration and the lifetime use of cocaine. These results seem to indicate that the distinction between these two target groups does not apply for cocaine use in general, and both groups more or less seem to belong to the same group of 'drug users'. But a closer look at the data for the different cities revealed marked differences between these two groups as regards the prevalence rates of cocaine powder and crack cocaine and the routes of administration.

When the different prevalence of crack cocaine was taken into account and the two forms of cocaine were not



separated, the differences between the treatment group and the marginalized group became more evident, indicating a clearly higher intensity of cocaine use in the marginalized group. As regards the routes of administration, the overall similarity disguised the marked differences between the cities, and the two groups, respectively, and the most important factor for injecting cocaine powder seems to be the use of heroin rather than belonging to the treatment group or the marginalized group. So, taking into consideration the use of cocaine in general, the use of heroin and the multiple substance use, the marginalized group showed the most problematic consumption pattern in terms of the highest intensity of cocaine use, the highest intensity of heroin use and of multiple substance use.

This is not to say that the treatment group's substance use data need no further considerations. The treatment group showed a substantial cocaine use, and to a lower degree and with differences between the cities, of other substances as well, which first of all indicates the need for a re-evaluation of their treatment. This was to be expected, considering that the treatment group was in fact in treatment because of their heroin use, and considering the evidence from the international literature which shows that cocaine use by methadone patients often compromises treatment [21–23].

Despite the differences between the target groups, and within the target groups between the cities, multiple substance use was the predominating use pattern. Even if alcohol was excluded from the analysis, only a minority had exclusively used cocaine. In contrast to the prevalence of multiple substance use, this issue is only seldom addressed in research. Although there is a growing awareness that the use of only one psychotropic substance is the exception and that multiple substance use is the rule, the respective theoretical and empirical knowledge is scarce, and there is an urgent need for research dealing with this topic [24].

As regards the differences between cocaine powder and crack cocaine, the data first of all indicates that considering the fear of an epidemic spread of crack cocaine as in the USA [25], the use of crack cocaine obviously has not spread into socially integrated user groups, and even within socially disintegrated groups seems to be restricted to some regions in Europe. Hence, the use of crack cocaine has to be considered on a local or regional level, which is confirmed by the results of other national studies showing that even within one country the use of crack cocaine is often restricted to some cities or regions [26–29]. In those European countries with a relevant prevalence of crack cocaine, cocaine powder was the 'earlier' form of cocaine,

and crack cocaine was introduced later. In line with this, in the present sample the use of crack cocaine started later, and only a minority of those with a history of using both forms started with crack cocaine. Currently, a small group was still using crack cocaine as well as cocaine powder, the majority of them either injecting cocaine powder and smoking crack cocaine, or smoking crack cocaine and snorting cocaine powder. Little is known about this group, its size and the reasons for using both forms by means of different routes of administration, since most studies – if at all – distinguish between cocaine powder and crack cocaine without presenting data concerning the parallel use.

The analysis of the patterns of use of different groups revealed that the consumption profiles of those who used crack cocaine as well as cocaine powder, those who used only crack cocaine and those who were injecting cocaine powder were quite similar, and differed from those who were using cocaine powder by non-injecting modes, with the latter showing a comparatively less problematic consumption pattern. This confirms the high importance of the routes of administration of cocaine powder, and at the same time shows that the dominating public discussion about the differences between cocaine powder and crack cocaine disguises the differences within the group of cocaine powder users.

Finally, there have to be some remarks concerning the sample strategy. While most of the results presented here are in line with the expected differences between the three target groups, others raise questions about the appropriateness of the distinction between them. This may be due to different situations in the participating cities, but it may also be a result of varying degrees of difficulties to recruit cocaine users for such a study, which may have lead to diverging recruitment strategies. Anyhow, future analyses of the data in hand will have to consider whether creating other subgroups is more appropriate to describe differences between cocaine users in Europe.

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